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# JUDICIAL DECISION MAKING IN INTEREST ARBITRATION: EQUITY, EQUALITY, OR ANCHORING?[1]

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W.P. 1471-83 September 1983

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# JUDICIAL DECISION MAKING IN INTEREST ARBITRATION: EQUITY, EQUALITY, OR ANCHORING?[1]

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# Abstract

This study uses a simulation methodology to systematically analyze the explanatory power of three alternative distributive justice norms (equity, equality, and anchoring) in describing the judgments of arbitrators in conventional arbitration. Specifically, 69 experienced arbitrators determined a wage settlement for 25 simulated disputes. Each dispute was described by the same seven criteria, which provided data relevent to the three alternative norms of arbitration. The weightings of the criteria were determined for each arbitrator by regressing wage settlement on the seven criteria. In addition, clusters of arbitrators employing similar policies were identified. Results indicated that arbitrators are very consistent in their judgments. However, they do not subjectively know the factors that affect their judgment. In addition, the results showed that the most common arbitration norm was anchoring; to maintain the status quo by simply adjusting the present wage by the average arbitrated increase in the industry. Equity[2] (inflation rate, financial condition of the firm, average local wage) and equality (union and management final offers) factors were far less important in the judgment policies of arbitrators. In addition to investigating these issues, the discussion section critically examined the benefits and limitations of the developed simulation procedures for understanding and improving the arbitration process.

The use of arbitration is creating a quiet revolution in the way industrial disputes are being resolved. While arbitration represents a well used resolution technique in the labor-management conflict arena, its use has recently begun to extend to a wider variety of conflict. Under binding arbitration, if two parties do not reach a resolution on their own, they are compelled to accept the decision of a mutually agreed upon third party. While arbitrators have readily expressed their views on how arbitrators decide cases, very little is known objectively about the decision processes of actual arbitrators. More broadly, the decision literature has not focused on decision makers trying to make judicial decisions. This knowledge void inhibits the training of new arbitrators and the diffusion of the arbitration procedure to other conflict domains (e.g., divorce, budget determination, consumer disputes, transfer pricing, etc.). This study examines the importance of understanding the decisions of labor-management arbitrators, specifies competing hypotheses from three alternative norms of distributive justice concerning the determinants of the judgments of arbitrators, and uses a simulation methodology to systematically identify the distributive justice norms used by arbitrators in award determination.

The development and investigation of the impact of alternative interest (contract determination) arbitration methods on negotiator behavior has captured the interest of researchers. The most common form of arbitration is conventional arbitration (CA). CA provides for a third party to resolve disputed issues such that the final outcomes balance the political and organizational needs of each party (Kochan, 1980). While the use of CA has been increasing (Wheeler, 1978; Kochan and Baderschneider, 1978), critics of CA have identified a number of deficits it has on negotiator behavior. The most important of these is that the possibility that the arbitrator will "split the difference" may result in (and reward) negotiators avoiding concessions (Northrup, 1966; Stevens, 1966; Starke and Notz, 1980; Bonn, 1972; Anderson and Kochan, 1977). This "chilling effect" is posited to occur so that bargainers will offset the negative effects of the arbitrator's compromise by maintaining a polar position. To the extent that arbitrators do split the difference, a major deficiency can be expected to result in the bargaining process. A number of alternative arbitration procedures have been proposed. Thus, a critical role of this study is to examine the claim that arbitrators split the difference. We will return to this question as the alternative models of distributive justice are proposed.

While the recent attention to the development of more effective methods of arbitration is important and intriguing, research has largely ignored an equally important aspect of the arbitration process -- the arbitrator. Researchers have not examined the arbitrator as a source of variation within the arbitration process. Arbitrators consider the evidence presented and make decisions based on this evidence. What evidence is most important to arbitrators? Is there consistency within and between arbitrators in the criteria that are important in award determination? Unfortunately, the existing literature does not address these critical questions. To the extent that consistency is lacking, an added source of variation exists in the arbitration process beyond the merits of the cases presented. The examination of the criteria used by arbitrators, in general, and the consistency of these criteria across arbitrators are the primary objectives of this study.

What is a good judicial decision? In the courtroom? By a funding agency deciding how to allocate funds between two non-profit organizations? From an arbitrator? Principles for the allocation of constrained resources have been a central debate among philosophers for centuries. The arbitrator's task is just that: the search for the appropriate way to distribute resources between management and labor. Bird (1967) has noted that the classic utilitarian philosophers--Bentham, Mill, and Sidgwick--defined the purpose of social justice to be the distribution of resources to achieve "the greatest satisfaction for the greatest number." Keeley (1978), however, has criticized this definition for (1) being difficult to operationalize; (2) the questionable validity of interpersonal comparisons of satisfaction across societal members; (3) the difficulty in assuring the implementation of this goal; and (4) the vague connection between aggregate social utility and system stability.

Keeley's (1978) criticisms are directly applicable to the arbitration process. In addition, the classic philosophic principles deal with distribution among individuals, while the arbitration process deals with the distribution of goods between coalitions (union and management). While the classic position may question the form of modern organization, this paper deals with the arbitrator's task within these organizations. With these criticisms in mind, this paper will explore the notion of distributive justice in the arbitration task, specify three _operational_ norms of distributive justice, propose a unique methodology for providing competing tests of these three norms, and discuss the ability of this framework to generalize to models of distributive justice in other third-party contexts.

Elkouri and Eklouri (1976) propose distributive justice norms for arbitrators by suggesting that the optimal arbitrated resolution would be one that (1) was equitable, (2) was completely acceptable to both parties, and (3) simultaneously maximized the valued outcomes of both parties. A bit of reflection suggests that this task is formidable at best and impossible at worst. These goals may not be simultaneously achievable and in certain cases may be directly conflicting. What criteria do arbitrators objectively use in making decisions? Potential answers to this question come from three alternative norms of distributive justice which are delineated below.

The Equity Norm--Distributive Justice Position 1. The most commonly accepted norm in arbitration is equity. There seems to be strong agreement that (1) the financial needs of the employee, (2) the financial condition of the firm, and (3) comparisons to relevant local firms should be included in the decision processes of arbitrators (Elkouri and Elkouri, 1976). In essence, the equity position suggests that the contract should be determined according to comparable standards--within certain constraints concerning the needs of the employees and the firm. The equity position is consistent with the social psychological position of Deutsch (1975) who suggests that in cooperative relations in which economic productivity is a primary objective, equity should be the dominant distributive principle. One version of the equity norm can be seen in libertarian theories of justice (e.g., Nozick, 1974), which argue that individuals are entitled to the resources that a free market would provide. Singer (1978) further argues that deviating from an equitable distribution reduces the incentives provided by a free market.

The Equality Norm--Distributive Justice Position 2. While our society may argue in favor of the equity principle, Starke and Notz (1981), in contrast, provide moderate evidence that actual arbitrators and students acting as arbitrators tend to split-the-difference in CA. However, their analyses are based on one arbitrated judgment. Further, Ryder (1968) objects to the cynical view held by Notz and Starke (1981) and others that arbitrators split-the-difference. In addition, Farber (1981) argues that, rather than viewing arbitrators as mechanically splitting-the-difference, it may be more accurate that conflicting parties position themselves around the expected arbitration award. Thus the question of whether arbitrators follow a norm of equality, rather than making a straightforward equity judgment, remains a confused and emotionally volatile issue. Other data by Bernstein (1954) and Wheeler (1974) found a large amount of compromise by negotiators. However, without knowing what would constitute an equitable judgment, it is impossible to discern the existence of a tendency to split-the-difference.

The notion of equality is the basis of Rawl's (1971) egalitarian theory of justice. Rawl's central argument is that resources should be distributed _equally_ except in those cases where an unequal distribution would actually work to everyone's advantage. This view of equality, however, deals with the distribution of all resources (not just disputed resources) and deals with the distribution of resources among all individuals (not coalitions) in a society. Nevertheless, the use of the equality norm by arbitrators has been suggested frequently. In this paper, the definition of the equality norm will be limited to the degree to which arbitrators equally divide _disputed resources_ between the _defined coalitions_ (union and management) to the dispute.

_The Anchoring (Status Quo) Norm--Distributive Justice Position 3._ While various philosophical positions support the norms of equity and equality, Kahneman and Tversky (1974) have suggested that humans have a systematic tendency to make judgments by selecting an anchor (e.g., last year's contract) and making only minor adjustments from that anchor. This maintenance of the status quo is consistent with arbitrators who suggest that they think in terms of (1) percent increases to the present wage, and (2) comparisons to percent increases of contracts of comparable firms in making awards. Many arbitrators would argue that using a present wage adjustment is typically equitable. However, in cases where the present wage was inequitable, the anchoring norm will result in distinctly different awards than the previously defined equity norm.

The anchoring norm implies that the previous contract is a factor in arbitrator judgment. The use of a percent increase criterion dictates the anchoring of judgment based on existing conditions. This norm is consistent with the World War II Labor Board's strategy which explicitly decided to give great weight to maintaining the position of the firm and workers in their industry wage structures (Kochan et al., 1979). This suggests, however, that well paid employees will tend to stay well paid, while poorly paid employees will tend to stay poorly paid. Thus, inequities in previous contracts are likely to remain to the extent that arbitrators think in terms of percent adjustment, rather than the judged appropriate wage.

## Testing Alternative Theories of Distributive Justice

In addition to confusion over the norms that arbitrators actually use, there exists a diversity of opinion about what arbitrators should do. While the norm of equity according to the standards described earlier is widely accepted, many scholars also argue that the tendency to compromise (equality) is normal and appropriate behavior (Anderson, 1974; Donn, 1977; Nelson, 1975; Stevens, 1966; Swimmer, 1975). Further, the numerous analyses of the chilling effect attest to the generally accepted view that arbitrators compromise when making awards (Starke and Notz, 1981). No discussion exists in the literature of the use of an anchoring norm. If the equity hypothesis is accurate, arbitrators should be strongly influenced by comparative economic variables. If the equality hypothesis is accurate, arbitrators should be strongly influenced by the final offers of the conflicting parties. Finally, if the anchoring norm is accurate, arbitrators should be heavily influenced by last year's wage and the percent increase of comparable contracts.

This paper seeks to determine objectively the weights that arbitrators assign to factors in the award process. The statistical technique used to capture objective weights of arbitrators is regression analysis (see Slovic & Lichtenstein [1971] for a review of using regression analysis to capture decision processes). Regression analysis, in this context, is used to determine an arbitrator's implicit weights in award determination. This approach necessitates that participating arbitrators make quantitative award decisions in a large number of cases, each of which is defined by a set of factors, which in turn can take on a number of values. If there are a sufficient number of cases for which the arbitrator makes an award, and each case is described by the same set of factors, then a regression equation can be developed for the arbitrator which objectively describes his/her idiosyncratic model for making arbitration awards. This procedure, referred to as policy capturing, has previously been used to investigate promotion policy (Stumpf & London, 1981), performance appraisal (Anderson, 1977, Naylor & Wherry, 1965; Taylor & Wilsted, 1977; Zedeck & Kafry, 1977), and job choice (Feldman & Arnold, 1975; Zedeck, 1977). While many authors have attempted to elaborate on more complex representations of judgment, previous research has documented that the basic linear regression provides a robust representation of actual decision processes (cf. Stumpf & London, 1981).

While policy-capturing research has demonstrated its power in describing expert and non-expert judgment, it has also shown that only moderate agreement typically exists between the objective weights used by raters and the subjective weights that raters believe that they use (Cook & Steward, 1975; Stumpf & London, 1981). Further, subjective weights tend to underestimate the objective importance of major elements and overestimate the objective importance of minor elements (Feldman & Arnold, 1978; Slovic & Lichtenstein, 1971; Zedeck & Kafry, 1977). Following this reasoning, it is expected that arbitrators perceive a more equal rating across factors than an objective analysis would indicate.

In the present study, three distributive justice norms are examined as contributors to the award decision of arbitrators: (1) equity, (2) equality, and (3) anchoring. The existing labor-relations literature argues that equity considerations will play a primary role in award determination. This research examines the competing hypothesis that equality ("splitting-the-difference") considerations will be the primary determinants of the awards made by arbitrators. In addition, the study examines the third competing hypothesis that anchoring effects will be the primary determinants of arbitrator judgment. In addition, the objective weights that arbitrators use will be compared to the subjective weights that they think they use. Further, the study will examine the consistency of objective weights across arbitrators. Finally, the discussion section will critically examine the benefits and limitations of the simulation procedure used to improve our understanding of the arbitration process.

## METHOD

### Subjects

Simulation materials were sent out to the entire membership of the National Academy of Arbitrators and the participants of a regional meeting of the American Arbitration Association (N=584). While only 69 usable responses were obtained (61 from the National Academy of Arbitrators and 8 from the American Arbitration Association), a number of reasons exist for the low response rate. First, the task required a moderate amount of time. Second, as will be examined in the discussion section, experts are often resistant to seeing the "complex" decisions that they make simplified for the purpose of simulation. And third, the percentage of interest arbitration (contract determination) to grievance arbitration is quite low. Since the sample, on the average, has substantial experience doing interest arbitration, it may be that arbitrators with little interest arbitration experience self-selected themselves out of the sample. This explanation is supported by letters from a number of non-participants from the target population. No significant differences exist between the two groups of arbitrators on any of the demographic data or the models of judgment that follow.

The mean age of the response group was 60 years. Based on self-reported data, the mean number of interest arbitration cases heard by the response group was 31, while the mean number of total arbitration cases heard by the response group was 989. To compare this to the targeted population of arbitrators, this data can be compared to ongoing research by Helburn and Rodgers (personal communication) in which they obtained 286 responses from the National Academy of Arbitrators on a survey that required far less time from participants. Their sample had an average age of 60.5 (consistent with the expectations of individuals knowledgeable about this organization). The mean number of interest arbitration cases heard by their respondents was 13.1 and the mean number of total arbitration cases heard by their respondents was 295.3. Thus, the current respondents had a very similar mean age to this large sample, with significantly more experience. This supports the earlier argument that arbitrators may have self-selected themselves based on interest arbitration experience. Finally, of the response group, 67 were male.

## Procedure

Each arbitrator was asked to judge 25 hypothetical interest arbitration cases where the only remaining unresolved issue was wages. They were asked to provide the award they would make under CA.

Hypothetical Cases. Each of the 25 hypothetical cases was described in a paragraph in terms of 7 criterion factors. For each factor, there were five possible levels. The total set of 25 cases had five cases for each of the five levels of each factor.

In order to maintain parallelism between cases, while providing necessary diversity, twenty-five industries were identified that had varying average national wages. These national wages were adjusted very slightly to create a systematic pattern of 25 national wages that ranged from .40, .45, .50... 1.55, 1.60 times $8.66, where $8.66 was the mean of all 25 actual national average wages. This procedure allowed the wages awarded by arbitrators to be standardized to the $8.66 norm by multiplying the award given by the product of $8.66 divided by the national wage. This procedure necessitates the exclusion of national average wage from subsequent analyses. It did, however, allow for the manipulation of the variables as multiplicatives of the national wage. This procedure is described below.

Seven criteria were chosen for this study to represent the three norms of distributive justice discussed earlier: (1) equity considerations, (2) equality considerations, and (3) judgment anchors. Three factors represented issues associated with an equity norm of distributive justice:

- The inflation rate was stated to be either 7%, 9%, 11%, 13%, or 15%.
- The financial health of the firm was stated to be either terrible, poor, fair, good, or excellent.
- The average local wage for similarly qualified employees was stated to be equal to the average national wage in the industry times either 87%, 94%, 101%, 108%, or 115%.

Two factors represented issues associated with an equality norm of distributive justice:

- Management's final offer was stated to be equal to the average national wage in the industry times either 104%, 105.5%, 107%, 108.5%, or 110%.
- Union's final offer was stated to be equal to the average national wage in the industry times either 111.5%, 113%, 114.5%, 116%, or 117.5%.

Finally, two factors represented issues which are argued to represent an anchoring norm of distributive justice:

- The present wage was stated to be equal to the average national wage times either 96.5%, 98%, 99.5%, 101%, or 102.5%.
- The average arbitrated wage increase of other contracts in the industry was stated to be 6%, 8%, 10%, 12%, or 14%.

Orthogonality between factors was achieved artificially by pairing each of the five levels of each factor once, and only once, with all five levels of each other factor. Thus, the number of possible combinations between any two factors is equal to five times five, or twenty-five -- which is equal to the number of cases in the simulation.[4] While orthogonality between variables may not optimally approximate the natural state of these variables (this will be examined in detail in the discussion section), it is easier to interpret the importance of alternative factors when there is no inter-correlation (Darlington, 1968; Zedeck & Kafry, 1977). The following is an example of the 25 simulated cases:

### Situation 18

> In a town with 102,000 people, workers with similar skills and backgrounds to the employees of this radio and broadcasting company were paid \$8.31/hr., while the national wage for this industry was \$8.23/hr. The financial outlook for this company is fair in light of the 11% inflation rate. The present average wage for this company's union is \$8.44/hr. Contract negotiations have reached an impasse. Both sides, however, have agreed to submit final offers to you, the arbitrator, and to be bound by your decision for a period of one year. Comparable pay increases from collective bargaining agreements in the industry are running about 8% this year. Management's final offer is \$8.56 (a 1.4% increase) while the union's final offer is \$9.55 (a 13.2% increase).

After the arbitrators completed the 25 cases, they assigned subjective weights to the seven factors, plus an eighth category for other considerations. The specific task required that the rater allocate 100 points to the eight factors according to their relative importance. Certain comparisons that follow necessitate having the seven independent factors (rather than the eight categories) add up to 100. To obtain this property, the weights of the seven independent factors were adjusted by dividing the weight of each of the seven factors by the sum of the weights of all seven factors. The resulting seven adjusted subjective weights add up to 100. This procedure has been used by Hoffman (1960) and Zedeck and Kafry (1977) because it is easily understood and insures that subjective impressions are translated into numerical form without interpretation by the researcher.

Background Data. The arbitrator was then asked to provide data on sex, age, number of interest arbitration cases heard, number of total arbitration cases heard, primary occupation (full-time arbitrator, professor, attorney with non-labor practice, union advocate or attorney, management advocate or attorney, or other), and fields in which he/she received a graduate degree (law, economics, industrial relations, business, other, none). Finally, arbitrators could give their names and addresses if they wished to receive a copy of the results. Anonymity was guaranteed. Responses were sent back in a provided business reply envelope.

## Analyses

A multiple regression equation was computed for each arbitrator. The squared multiple correlation, $R^2$, represents an indication of the consistency of the arbitrator's judgment across the 25 cases. Given the orthogonality of the seven independent factors, zero-order correlations between the factors and wage determination could be used to index the importance of each factor for each arbitrator's overall wage judgments. However, to facilitate comparisons of weights between arbitrators and to subjective weights, an alternative index, relative weights, was used to represent the relative importance of each criterion element. This index represents the objective, implicit weights used by arbitrators. Relative weights (RW) are computed as follows (Hoffman, 1960):

$$RW_{is} = B_{is} r_{is} / R_s^2,$$

where $RW_{is}$ is the relative weight of the ith factor for the sth arbitrator, $B_{is}$ is the beta weight of the ith factor, $r_{is}$ is the zero-order correlations between the ith factor and wage determination, and $R_s^2$ is the squared multiple correlation for the sth arbitrator. Since the sum of the relative weights is 1.0, Hoffman's index describes the relative contribution of the seven factors as a proportion of the predictable linear variation. These relative contributions can then be compared to assess the explanatory power of each of the three norms of distributive justice. Multiplication of the relative weights by 100 permits a direct comparison between these objective weights and the subjective weights obtained from the 100-point allocation procedure (Zedeck and Kafry, 1977). Finally, the relative weights can be compared, averaged, clustered, or treated in other ways as new data where the arbitrator is treated as the unit of analysis.

## Results

Table 1 presents the relative weights of each of the seven independent factors for each of the 69 arbitrators. For example, 33.8% of the predictable variation in award determination for arbitrator 11 was accounted for by the financial health of the firm. While relative weights are by definition positive, if the associated beta was negative, this is noted in the table. Thus, for arbitrator 11, while the financial health of the firm was positively related to the wage awarded, the inflation rate was, surprisingly, negatively related to the wage awarded. Most of the relative weights in Table 1 are based on positive beta coefficients, as would be expected. The column averages represent the average relative weights associated with each of the seven factors. In general, 1 or 2 factors accounted for the majority of the

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INSERT TABLE 1 ABOUT HERE

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predictable variation. Overall, the two most heavily weighted relative weights for each arbitrator (for example, for Arbitrator 1, the financial health of the firm and the present wage jointly accounted for 75.7%), on average, accounted for 72.4% of the predictable variation. Finally, the $R^2$ associated with each arbitrator is noted, as well as the average $R^2$ across arbitrators. $R^2$ measures the degree to which an arbitrator's judgment can be consistently predicted by our seven linear factors.

These results show the participating arbitrators to be very consistent in making awards. Across all 69 arbitrators, the average $R^2$ was equal to .693. That is, the linear equation constructed based on their judgments was, on average, able to explain 69.3% of the variation in their award behavior. The $R^2$ values ranged from a high of 1.00 (Arbitrator 14) to a low of .2018 (Arbitrator 25). Differences in $R^2$ values were not related to any of the demographic data collected.

Examination of the mean objective relative weights (Table 2) for the seven factors shows that three factors accounted for 72.3% of the explainable variation in award determination. Specifically, the present wage (30.5%)[5], the average arbitrated percentage increase in the industry (21.2%), and the financial health of the firm (20.6%) were the critical factors, in the aggregate, in explaining the judgments of arbitrators. This suggests that the two factors that anchor judgments to the previously existing contract are critical in explaining arbitrator judgment (accounting for 51.7% of the explainable variation). Further, arbitrators focus on the ability of the firm to pay as the most important equity consideration. The other equity factors and the final offers of union and management, in the aggregate, contributed little to the explainable variation in the judgments of our arbitrator sample.

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INSERT TABLE 2 ABOUT HERE

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Table 2 provides a comparison of the average objective weights (from Table 1) to the average subjective weights that arbitrators believed that they used in award determination. Arbitrators believed that they used a more equal weighting policy than an objective analysis of their decisions suggests. While the seven objective weights varied from 3.7% to 30.5% (range = 26.9%) the subjective weights only varied from 8.9% to 22.4% (range = 13.5%). This suggests that while arbitrators claim that they are using a very complex decision process, their actual decisions are often explainable in terms of a relatively small number of factors. This difference between objective and subjective weights is confirmed by comparing these weights for each of the seven independent variables using univariate t tests. The differences between objective and subjective weights were significant ($p < .001$) for four of the seven factors. As predicted, the most important objective factors (present wage, average arbitrated increase) were viewed as significantly less important by the subjective procedure, while the least important objective factors (union's final offer, inflation rate) were seen as significantly more important by the subjective procedure.

An important caveat to the interpretation of the mean relative weights concerns the large standard deviations associated with these means. Table 1 allows for the examination of the policy of each of the arbitrators. In addition, the issue is raised of whether it is possible to describe the strategies of differing groups of arbitrators. Cluster analysis was used to identify empirically three distinct clusters of arbitration policies based on the seven relative weights. Cluster analysis empirically groups individuals to maximize the similarity within cluster, while simultaneously minimizing the similarity between clusters. Cluster A was composed of 25 arbitrators (Arbitrators 1-25 in Table 1), Cluster B was composed of 14 arbitrators

(Arbitrators 26-39 in Table 1), and Cluster C was composed of 30 arbitrators (Arbitrators 40-69 in Table 1). The mean relative weights for each cluster are provided in Table 3.

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INSERT TABLE 3 ABOUT HERE

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Cluster A arbitrators ("organizational information") weighted the financial health of the firm and the present wage most heavily in award determination. These two factors combine to account for 63.5% of the explainable variation in the judgment of Cluster A arbitrators. Cluster B arbitrators ("mixed model") weighted present wage, average local wage, and management's final offer most heavily. More distinctive of this group is their more equal weighting across the seven variables. This group of arbitrators begins to approach the more complex model that arbitrators describe in giving subjective weights. Cluster C arbitrators ("anchored judgment") weighted present wage and average arbitrated increase in the industry most heavily. These two factors accounted for 70.9% of the explainable variation in the judgment of Cluster C arbitrators.

To determine the significance and strength of the cluster differences for each independent factor, separate between-cluster ANOVAs and paired-cluster comparisons were conducted on each factor. With the exception of the inflation rate and union's final offer variables, strong differences emerge between clusters on all of the remaining variables. Cluster A weighted financial health for the firm significantly more ($p < .001$) than either of the other two clusters. Cluster B weighted the average local wage and management's final offer significantly more ($p < .001$) than the other two clusters. Cluster C weighted the average arbitrator's increase in the industry significantly more ($p < .001$) than the other two clusters. And finally, Cluster C weighted present wage significantly more than Cluster A ($p < .001$), while Cluster A weighted this factor signficantly more than Cluster B ($p < .05$). The clusters did not differ significantly on any of the demographic data collected.

## Discussion

The present study was concerned with how arbitrators make judgments from the multiple independent factors presented in the interest arbitration process. The focus of the study has been the decisions of arbitrators, rather than the arbitrators' interpretations of their decision processes. The purpose of a linear models approach is to identify objectively the explicit weighting policies of individuals who are central to the labor-management arbitration institution. This section will discuss the results of this procedure, identify the advantages of this methodological approach, specify the limitations and criticism of this methodology, and argue for the future of this approach for better understanding judicial decision making.

The first observation from the data is that arbitrator judgment, on average, is very consistent across cases. The $R^2$s from the study suggest that this sample of arbitrators have developed clear criteria for award determination, and that they reliably use these criteria. Despite this consistency within arbitrator, the data also suggest that, on average, arbitrators do _not_ have an accurate view of their policies. They tend to believe that they use more factors than the objective data suggests. Further, arbitrators tend to deemphasize the critical role that one or two primary factors play in their decision making. It is interesting that arbitrators could be so predictably biased in their self reports, yet consistent in their award behavior.

While our sample was found to be extremely consistent within arbitrators, there existed large differences in the policies between arbitrators. Three distinct clusters of arbitrator policies emerged from the data analysis. Cluster A primarily made their judgments based on organizational information -- that is, information that was obtainable from the firm, with little attention to the external environment. This group appears to evaluate the firm's ability to pay, and from this information they make an "appropriate" adjustment to the present wage. This type of policy will tend to maintain the status quo, adjusting only for the financial position of the firm (an equity factor). This group of arbitrators gave very little weight to the final offers of the parties.

Cluster B exhibited mixed models in their awards. Like the first group, they were anchored by the present wage, but they were also concerned about the average local wage (an equity factor) and the final offer of management (an equality factor). Overall, this group appears to adjust the present wage according to local comparisons, while at the same time trying to make an award at a wage a consistent amount (or percentage) above management's final offer.

Cluster C (the largest cluster) exhibited an unexpectedly high amount of anchoring in their judgments. This group seems to adjust the present wage by the average percent increase in the industry. This policy will dramatically keep underpaid firms underpaid, and overpaid firms overpaid. This policy largely excludes all concern for equity (inflation, the financial condition of the firm, and wage comparisons) and equality (the final positions of the parties). If equity existed before, it will remain. If equity did not exist before, this arbitration policy will not create equity.

Overall, considerable evidence suggests that substantial differences exist between arbitrators concerning the trade-offs among the multiple factors in an interest arbitration case. These differences are even observed in the relatively sterile confines of controlled simulated cases. It is expected that the complexities of actual cases would further differentiate how varying arbitrators would deal with the compound task of integrating the various components that go into an arbitrator's decision. When labor relations scholars discuss the determinants of arbitrated decision making, it is common to identify the facts of the case. This study adds that differences between arbitrators may be an important determinant in how cases are decided. These differences may be manifested not only in a bias towards union or management, but also in how arbitrators weight factors involved in the decision. This raises a host of questions concerning whether the training of arbitrators should create stronger norms concerning the importance of varying factors. Without this consistency between arbitrators, the selection of an arbitrator may be as important as the merits of the case in award determination.

The literature on arbitrator decision making has been primarily concerned with the equity/equality issue. The results of this study strongly suggest that, for most arbitrators, the final offers of the two parties do not play an important role in their decision processes. However, the data suggest that this does not imply that arbitrators primarily use equity norms. Rather, arbitrators are extremely affected by the status quo. In each of the three clusters of arbitration policies, the present wage surfaced as an important factor in wage determination -- it was the only factor to have this status in all three clusters. Thus, arbitrators are anchored by the existing wage. This suggests that many arbitrators determine the equitable percent increase, rather than determining the equitable wage. Objectively, they do not correct past inequities in the pay structure, rather they maintain them at approximately the same level.

The finding that arbitrators are affected strongly by the anchoring norm of distributive justice suggests that conventional arbitration can be predicted to lead to a very similar contract as the previously existing contract. Interestingly, while this study refutes the common criticism that conventional arbitration leads arbitrators to split the difference which leads to the chilling effect, it raises an alternative criticism of conventional arbitration. Specifically, if arbitrators are following an anchoring norm of distributive justice, conventional arbitration may prevent an industry from breaking out of past inequitable standards. Alternatives, such as final-offer arbitration, may provide the opportunity for major changes and the setting of new standards (e.g., the recent changes in salary structure that have been observed in baseball) that would not occur in conventional arbitration.

The results discussed above were derived from a unique methodology. They were based on simulated cases in which the arbitrators where presented with a very limited amount of data. In addition, the political environment in which the arbitration process takes place was not represented in the study. Further, the tripartite decision making process that is used in many interest arbitration cases was not simulated here. Thus, this research cannot begin to claim to represent the process of arbitration. However, certain features of the methodology uniquely allow for the identification of the norms of distributive justice that go into award determination. Specifically, this procedure allowed for the controlled manipulation of seven critical factors across multiple cases. Thus, it is possible to identify causally how arbitrators make trade-offs between factors that go into their decision making process. In addition, this approach is unique in that it allows for the determination of objective weights for the multiple factors that affect arbitrator decisions without the subjective interpretation by the researcher.

While this study's methodology allows for unique advantages, it is this uniqueness that raises two sets of potential limitations. The first potential limitation questions the generalizability of the results of this study to actual arbitrated judgments. This potential attack on the results of this study can be best seen in the contents of a number of confidential personal communications received from non-participating members of the targeted sample of arbitrators:

> ...My problem is that the information given bears no relationship to reality or to what would be furnished in an interest arbitration case.... Any arbitrator handling interest cases balances the entire structure even if only the pay issue is before him or her as an issue to be decided.... Your questions do not refer to ability to pay, comparitive data or any other factors sometimes statutorily required to be considered by the arbitrator.
>
> ...if it was as simplistic in format as your models suggest, there would be no point to hold hearings -- and the cases would be submitted on stipulation -- but that's not how it happens...the true test of the professional arbitrator's competence is to 'sense' the true posture of the parties not from what is stated, but how it is stated, by the reaction of the other side, by what is not stated, and by countless other non-quantifiable measurements of what is acceptable, what will restore a cooperative relationship between the parties, and what, in short, is closest to what the parties would have done if they'd bargained through to a settlement.... Those off-the-record inputs cannot be ignored. They, indeed, outweigh the importance of any paper documentation presented as proposals or exhibits at some hearing.
>
> ...Wage determination is an art informed, however, to a very substantial degree by science, which includes painstaking inquiry in each individual case, careful detailed analysis, alertness to nuances that may very often not be data-bound, etc.
>
> ...You are on an illusory quest! Other arbitrators may respond to your questionnaire; but in the end you will have nothing but trumpery and a collation of responses which will leave you still asking how arbitrators decide cases... Telling you how I would decide in the scenarios provided would really tell you nothing of any value in respect of what moves arbitrators to decide as they do. As well ask a youth why he is infatuated with that particular girl when her sterling virtues are not that apparent. As

> well ask my grandmother how and why she picked a particular 'mushmellon' from a stall of 'mushmellons.' Judgment, taste, experience, and a lot of other things too numerous to mention are factors in the decisions.

The comments of these six experienced arbitrators clearly argues that this study does not capture the arbitration process. Yet, the study demonstrated the ability to capture something about the decisions of arbitrators in a very reliable manner. What is it then that this study captures? This study accurately captures the underlying distributive justice norms of arbitrators by determining how they make trade-offs between factors without the complexity inherent in actual arbitration cases. It is expected that many of the general results of this study (e.g., the importance of maintaining the status quo) would generalize to actual cases, but the underlying norms of distributive justice would be hard to identify in the face of the complexity surrounding actual cases.

A second potential limitation questions the ability to represent the judgments of arbitrators with linear models. Again, a confidential, personal communication from a participating member of the targeted sample of arbitrators sheds lights on this question:

> ...I recognize that I have made it very difficult to code my answer to question one (the subjective weightings) in your post simulation questionnaire. The reason for the multiple weighting scheme is that I apply different weights depending upon the product market and the financial condition of the company. If the product market is national then factor C (average arbitrated increases in industry) is the major contributor to my decision. If the product market is local then factor B (average local wage) is the major consideration. Likewise if factor D (financial condition of the firm) does not have to be considered because there is no inability to pay, argument factor A (inflation rate) then takes it place in importance.

This excerpt clearly states that a set of relative weights will not fully capture this arbitrator's model. Rather, the arbitrator delineates a moderating factor that influences his relative weights. Further support for the non-linearity of the policies of arbitrators comes from the following excerpts from a participating arbitrator's letter which specifies a multi-stage decision process, rather than the single stage process suggested by the linear models presented:

> ...It is highly doubtful that the same weighting of criteria can apply to every case study because the weighting is inherently affected by the circumstances of each case. For example, if the management offer is higher than would be warranted by other economic criteria, it is the sole source of the determination. If the union offer is lower than would be warranted by other economic criteria, it is then also the sole source of the determination...
>
> Then the second variable which has greater or less weight depending on whether it was good or bad was the company's financial situation. Obviously, no arbitrator is going to put a company out of business and the sole determining factor (albeit from a negative point of view) after some consideration of the inflation factor (which incidentally is more on the side of keeping up the real level of wages than on the side of management staying in business) is whether the company is able to pay the proposed wage increase. Thus, this factor is given greater weight in those cases where the facts indicated that the company was not able to pay.
>
> The third variable which has greater or less weight depending on whether the company is above or below industry standards, is comparable wage rates in other firms in the industry, both as to absolute level and level of increases for the current year. If the company is above standard and the level of increases was less than the union demand, then most likely management's offer is selected. The opposite is true if the company is below standard and can afford to bring its level up to the going rate.

Both of these arbitrators imply that a linear, single stage model can only give an approximation of the judgmental processes that affect the decisions of arbitrators. Tempering the power of this criticism is the substantial evidence that linear models of judgment give a very close approximation of what more complex models would specify (cf. Dawes, 1979). Nevertheless, if the judgments of arbitrators are to be represented, the investigation of nonlinear and multi-stage representations of judgment is a clear direction for future research.

The methodology in this study is far different from existing approaches to understanding the arbitration decision making process. In addition, this approach answers different questions. Most of the past literature has tried to describe subjectively the complexity of the entire arbitration process. This study has objectively identified only a small piece of this process -- the underlying value structure of arbitrators. Given these different pursuits, future research should be directed at integrating the richness of past research with the control and objectiveness of the current research. Further, the control and objectiveness of the current research should be generalized to study grievance arbitration, final offer arbitration, tripartite arbitration, and arbitration outside the labor-management domain (e.g., divorce, consumer disputes, etc.).

A major issue in interpreting the results of this study concerns the ability to generalize to actual arbitration and alternative domains of judicial decision making. Caution should be exercised in overgeneralizing the mean relative weights observed in the simulation. Nevertheless, the study does (1) provide three alternative norms of distributive justice that can be operationalized in other third-party contexts; (2) demonstrate that third parties are likely to exhibit large variation in their norms of distributive justice; (3) suggest that Kahneman and Tversky's anchoring effect is likely to generalize to judicial decision making; and (4) introduce a powerful methodology for studying third-party decision processes.

This research also raises a number of questions for the institution of arbitration and other uses of third-party intervention. Is it acceptable that widespread variation exists in distribution justice norms between third parties? Is it acceptable for arbitrators to decide the equitable percent increase, rather than the equitable wage? What distributive justice norms are viewed as appropriate? Are there distributive justice norms that are not acceptable? And finally, what structural changes could be made in the training and certification processes that would create the desired shifts in distributive justice norms used by third parties?

Finally, this paper suggests a methodology for training new arbitrators, identifying the distributive justice norms used by third parties, and examining the impact of a variety of structural changes (form of arbitration, detail of information presented, statutory regulations, etc.) on the policies of third parties. No longer is it necessary to implement a legislative change to examine the legislation's impact empirically. This research suggests that low cost simulation may provide a wealth of initial information on the impact a change will have on the decisions of arbitrators.

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## Footnotes

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2. While other equity criteria exist (e.g., industry wage comparisons), a limit to the number of factors investigated had to be set for experimental purposes.

3. An alternative definition for equality could be based on the resistance points, rather than final offers, of the two parties. This would lead to a different definition of the equality point if the parties' final offers are not equidistant from their resistance point. Methodologically, final offers are easy to measure, while no satisfactory procedure exists for measuring resistance points.

4. Interested readers can contact the author for more details on this procedure.

5. The finding of the critical importance of present wage relies on defining the dependent variable as the wage awarded, rather than the percent increase in wages awarded. Using the criteria of percent increase in wages awarded would hide the impact of using present wage as a factor on maintaining the status quo.

## Table 1

## Relative Weights** For Each of the Independent Factors for Each Arbitrator

| | Independent Factors | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Arbitrator Number | Inflation Rate | Financial Health of the Firm | Average Local Wage | Management's Final Offer | Union's Final Offer | Average Arbitrated Increase | Present Wage | $R^2$ |
| 1 | 1.2 | 31.1 | 0.2* | 7.3 | 0.3* | 15.4 | 44.6 | .7441 |
| 2 | 0.4* | 45.1 | 0.3* | 8.2 | 2.3 | 23.0 | 20.7 | .8301 |
| 3 | 0.0 | 44.4 | 0.0 | 1.3 | 2.8 | 15.0 | 36.4 | .5609 |
| 4 | 0.1 | 47.7 | 0.1 | 0.1 | 0.0 | 29.1 | 22.9 | .7828 |
| 5 | 2.3 | 40.8 | 0.2 | 2.9 | 0.6 | 4.8 | 48.4 | .8486 |
| 6 | 5.5 | 30.4 | 6.9 | 4.2 | 2.2 | 9.7 | 41.0 | .5030 |
| 7 | 0.0 | 25.3 | 1.5 | 7.7 | 0.6 | 25.4 | 39.4 | .6415 |
| 8 | 1.2 | 45.7 | 2.9 | 2.8* | 3.4* | 0.1* | 44.0 | .7960 |
| 9 | 1.3* | 46.6 | 5.0* | 17.3 | 0.8 | 19.7 | 9.3 | .7732 |
| 10 | 0.8* | 28.1 | 0.9* | 28.9 | 3.3 | 16.2 | 21.8 | .7905 |
| 11 | 11.8* | 33.8 | 0.7* | 14.6 | 0.7 | 19.5 | 18.8 | .7746 |
| 12 | 0.0 | 75.9 | 0.4* | 2.4 | 0.0 | 2.3 | 18.9 | .6330 |
| 13 | 2.4 | 44.0 | 5.3* | 28.9 | 7.4 | 6.5 | 5.5 | .6871 |
| 14 | 0.0 | 30.5 | 0.2 | 34.8 | 0.0 | 0.0 | 34.5 | 1.0000 |
| 15 | 0.7 | 51.4 | 5.5 | 12.9 | 4.6 | 3.6 | 21.3 | .7665 |
| 16 | 1.6* | 22.5 | 9.4* | 19.2 | 1.1 | 29.0 | 17.1 | .7207 |
| 17 | 2.2* | 55.9 | 2.5* | 10.6 | 0.5* | 15.2 | 13.1 | .7608 |
| 18 | 0.5 | 15.6 | 12.8 | 33.4 | 12.1 | 6.9 | 18.7 | .5878 |
| 19 | 0.1 | 21.2 | 0.5 | 28.2 | 19.1 | 10.1 | 21.0 | .7191 |
| 20 | 0.3* | 41.0 | 2.1 | 3.6 | 0.2 | 15.6 | 37.1 | .7744 |

Table 1 (continued)

| | Independent Factors | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Arbitrator Number | Inflation Rate | Financial Health of the Firm | Average Local Wage | Management's Final Offer | Union's Final Offer | Average Arbitrated Increase | Present Wage | $R^2$ |
| 21 | 2.4* | 23.9 | 5.4* | 15.9 | 0.0 | 18.8 | 33.5 | .7546 |
| 22 | 6.8 | 29.5 | 7.5 | 0.0 | 6.5* | 17.4* | 32.3 | .3152 |
| 23 | 2.1* | 37.6 | 2.7 | 15.6 | 6.7 | 25.6 | 9.7 | .6414 |
| 24 | 1.6 | 36.9 | 0.1* | 7.2 | 3.0 | 9.1 | 42.1 | .7641 |
| 25 | 6.4 | 34.5 | 3.8 | 18.3* | 2.4* | 34.3 | 0.2* | .2018 |
| 26 | 26.2 | 11.1 | 24.4 | 18.0* | 5.5* | 0.8 | 14.1 | .3193 |
| 27 | 0.6* | 0.2 | 45.4 | 43.0 | 1.7 | 3.3 | 5.8 | .6268 |
| 28 | 0.7 | 0.2 | 1.0 | 36.7 | 15.4 | 15.6 | 30.4 | .8669 |
| 29 | 0.6* | 4.0 | 2.5 | 33.0 | 0.1 | 23.3 | 36.6 | .6675 |
| 30 | 9.1* | 1.6 | 37.5 | 22.3 | 1.5 | 10.3 | 17.7 | .5683 |
| 31 | 0.5 | 4.2 | 2.2 | 47.4 | 13.1* | 18.1 | 14.5* | .2260 |
| 32 | 0.2 | 8.7 | 42.3 | 0.0 | 18.7 | 1.5* | 28.3 | .2540 |
| 33 | 0.0 | 0.0 | 9.8* | 41.0 | 0.0 | 39.6 | 9.8 | .2108 |
| 34 | 27.0 | 28.6 | 40.3 | 0.5* | 0.2 | 0.0 | 3.4* | .9766 |
| 35 | 0.2* | 12.0* | 1.0 | 68.3* | 13.4* | 4.8* | 0.3 | .8423 |
| 36 | 2.3 | 22.9 | 20.4 | 25.4 | 1.5* | 2.0 | 25.5 | .7557 |
| 37 | 1.0 | 5.9 | 27.2 | 3.4 | 4.9* | 9.0 | 48.6 | .5186 |
| 38 | 0.4 | 32.5 | 43.1 | 0.6 | 4.6 | 10.9 | 8.0 | .7418 |
| 39 | 1.6 | 19.2 | 29.6 | 16.8 | 4.0 | 10.7 | 18.1 | .8346 |
| 40 | 0.2* | 18.0 | 0.0 | 1.9 | 1.8 | 25.2 | 52.9 | .5588 |

Table 1 (continued)

| Arbitrator Number | Independent Factors: Inflation Rate | Financial Health of the Firm | Average Local Wage | Management's Final Offer | Union's Final Offer | Average Arbitrated Increase | Present Wage | $R^2$ |
|---|---|---|---|---|---|---|---|---|
| 41 | 0.7 | 17.8 | 2.9 | 14.0 | 3.2 | 12.0 | 49.5 | .5465 |
| 42 | 2.5 | 7.8 | 2.5 | 0.6 | 0.0 | 10.3 | 76.2 | .8372 |
| 43 | 0.4 | 5.3 | 0.6 | 17.1 | 3.2 | 43.6 | 29.7 | .8517 |
| 44 | 9.5* | 1.2 | 6.4* | 12.7 | 12.7 | 24.7 | 32.8 | .6062 |
| 45 | 18.3 | 2.0 | 5.0* | 8.3 | 22.1 | 8.5 | 35.8 | .4602 |
| 46 | 3.2* | 7.3 | 3.3 | 2.6 | 2.3 | 53.6 | 27.7 | .7238 |
| 47 | 0.2 | 21.0 | 1.2* | 1.8 | 9.5 | 43.3 | 22.9 | .8046 |
| 48 | 2.6* | 4.2 | 0.1* | 6.2 | 0.8 | 58.8 | 27.3 | .8762 |
| 49 | 0.4* | 0.6 | 0.0 | 0.0 | 0.3* | 66.9 | 31.8 | .8123 |
| 50 | 35.3 | 12.8 | 7.8 | 0.3 | 0.5* | 9.5 | 33.9 | .6860 |
| 51 | 6.5* | 0.0 | 7.7* | 12.8 | 3.3 | 6.5 | 62.9 | .6386 |
| 52 | 0.3 | 7.5 | 1.3* | 0.2 | 0.9* | 19.5 | 70.3 | .8650 |
| 53 | 0.2* | 0.1 | 0.2* | 0.0 | 0.7* | 62.2 | 37.1 | .9809 |
| 54 | 2.8* | 17.1 | 7.0 | 1.1 | 0.0 | 49.8 | 22.0 | .6280 |
| 55 | 3.0 | 16.7 | 4.2* | 2.0* | 0.2* | 62.1 | 11.9 | .9830 |
| 56 | 0.3* | 23.5 | 5.7 | 15.9 | 0.0 | 11.8 | 42.8 | .7761 |
| 57 | 15.6 | 14.4 | 2.5 | 0.1 | 0.0 | 25.3 | 42.2 | .6513 |
| 58 | 0.0 | 6.7 | 0.0 | 6.1 | 3.1 | 58.7 | 25.5 | .8202 |
| 59 | 3.4 | 25.4 | 11.3 | 6.1 | 0.9* | 1.9 | 51.1 | .8523 |
| 60 | 0.0 | 10.7 | 14.8 | 5.3 | 0.5 | 47.1 | 21.7 | .7677 |

Table 1 (continued)

| | Independent Factors | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Arbitrator Number | Inflation Rate | Financial Health of the Firm | Average Local Wage | Management's Final Offer | Union's Final Offer | Average Arbitrated Increase | Present Wage | $R^2$ |
| 61 | 1.1 | 16.1 | 0.0 | 0.1* | 1.6* | 14.9 | 66.1 | .7951 |
| 62 | 22.8 | 5.7* | 6.7 | 0.0 | 4.9* | 3.4* | 56.4 | .3215 |
| 63 | 1.5 | 11.0 | 11.4 | 25.8 | 0.0 | 2.3 | 48.0 | .6657 |
| 64 | 0.2 | 10.6 | 4.5 | 11.6 | 0.2 | 17.4 | 55.4 | .6280 |
| 65 | 11.8 | 0.2 | 0.9 | 17.5 | 14.0 | 20.8 | 34.9 | .7633 |
| 66 | 0.0 | 1.9 | 0.5 | 9.5 | 1.6 | 27.2 | 59.2 | .8638 |
| 67 | 7.4* | 31.3 | 0.1* | 3.6 | 1.1 | 49.2 | 7.3 | .6492 |
| 68 | 0.0 | 23.3 | 0.0 | 7.4 | 2.0 | 61.1 | 6.3 | .7341 |
| 69 | 0.1 | 7.7 | 0.2* | 1.6 | 0.5* | 43.6 | 46.3 | .9191 |
| Means | 4.0 | 20.6 | 7.4 | 12.7 | 3.7 | 21.2 | 30.5 | .693 |

** Relative weights have been multiplied by 100 and can be read as a percent; e.g., for arbitrator 1, 31.1 percent of the explainable variation is accounted for by the financial health of the firm.

* Denotes that the relative weight is based on a negative regression coefficient.

## Table 2

## AVERAGE RELATIVE OBJECTIVE AND RELATIVE SUBJECTIVE WEIGHTS

| Variable | Objective | Subjective | Significance Test of Differences Between Objective and Subjective Weights |
|---|---|---|---|
| Inflation Rate | 4.0 (7.1)[1] | 15.4 (9.3) | $p < .001$ |
| Financial Health | 20.6 (16.8) | 22.4 (15.9) | ns |
| Average Local Wage | 7.4 (13.9) | 9.5 (7.3) | ns |
| Management's Final Offer | 12.7 (13.9) | 8.9 (7.6) | ns |
| Union's Final Offer | 3.7 (5.2) | 10.5 (7.6) | $p < .001$ |
| Average Arbitrated Increase | 21.2 (18.3) | 16.0 (14.5) | $p < .001$ |
| Present Wage | 30.5 (17.7) | 17.2 (11.1) | $p < .001$ |
|  | 100.1 | 99.9 |  |

[1] Standard deviations are in parentheses

## Table 3

## CLUSTER MEAN RELATIVE WEIGHTS FOR THE SEVEN INDEPENDENT VARIABLES

| Cluster | A(n=25) | B(n=14) | C(n=30) | Significance Test Of Differences Between Clusters |
|---|---|---|---|---|
| Inflation Rate | 2.0 (2.8)[1] | 5.0 (9.4) | 5.0 (8.3) | ns |
| Financial Health | 37.5 (13.0) | 10.7 (10.9) | 10.9 (8.5) | $p < .001$ |
| Average Local Wage | 3.1 (3.4) | 23.3 (17.2) | 3.6 (4.1) | $p < .001$ |
| Management's Final Offer | 13.0 (10.8) | 25.4 (20.7) | 6.4 (6.8) | $p < .001$ |
| Union's Final Offer | 3.2 (4.4) | 6.0 (6.4) | 3.1 (5.0) | ns |
| Average Arbitrated Increase | 14.8 (9.5) | 10.7 (10.8) | 31.3 (21.9) | $p < .001$ |
| Present Wage | 26.0 (13.5) | 18.7 (13.7) | 39.6 (18.2) | $p < .001$ |
|  | 99.6 | 99.8 | 99.9 |  |

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[1] Standard deviations are in parentheses.

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